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EXAMINER	
PITARO, RYAN F	

ART UNIT	PAPER NUMBER
2174	

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/026,332	CHESS ET AL.	
	Examiner	Art Unit	
	Ryan F Pitaro	2174	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *09 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-28 have been examined.

Response to Amendment

2. This communication is responsive to Amendment A, filed 12/13/2004.

3. Claims 1-28 are pending in this application. Claim 1 is an independent claim. In the Amendment A, Claims 1-28 were amended. This action is made Final.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3,5-13,17,21,25-26,and 28 are rejected under 35 U.S.C. 103(a) as being obvious over Kanevsky ("Kanevsky", US#6,300,947) in further view of applicant's admitted prior art ("aapa", US2002/0199156).

As per independent claim 1, Kanevsky discloses a hardware-adaptable data visualization tool comprising:

a viewer module components are linked together based on performance capabilities, whereby different visualization tools are able to be tailored to different performance capabilities of different hosts (Column 1 lines 60-65).

Kanevsky fails to clearly disclose a data source and a viewer module. However, aapa teaches a data source for providing as a stream of data to be interpreted by a numerical data set ([0007] lines 6-10) and a viewer module providing a view of the numerical data set ([0008] lines 3-5). Motivation to combine would be so that the numerical data set could be continuously streamed, giving faster visualizations. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky's hardware-adaptable tool with aapa's teaching.

As per claim 2, which is dependent on claim1, Kanevsky in view of aapa discloses a hardware adaptable data visualization tool, wherein the viewer component module comprise:

a) geometry manager, responsive to the geometry information ([0007] lines 6-11)

b) interface module, responsive to user tool controls and inputs, and responsive to graphics output of the summary data ([0008] lines 13-16)

c) automation/scripting module, responsive to the flight plans for providing changes to display characteristics ([0008] lines 9-16 ;*wherein the flight plans are resulted from the nozzles and feed pressure*)

d) a visualization object client/graphics module, responsive to changes to display characteristics, providing summary data graphical representations (*inherently graphics will change if the data changes*)

e) a visualization object server provides the generated objects ([0009] lines 1-5)

f) any calculation module set, translating the numerical dataset for the visualization ([0007] lines 6-13)

g) query library module, converting different data source into application program interface ([0007] lines 6-9)

As per claim 3, which is dependent on claim1, Kanevsky in view of aapa discloses a hardware adaptable tool wherein the data source is CFD module ([0007] lines 1-8).

As per claim 5, which is dependent on claim 1, Kanevsky in view of aapa discloses a hardware-adaptable data visualization tool distributed across up to three different target hosts, communicating via a network and/or file system (Column 5 lines 29-36;)

As per claim 6, which is dependent on claim 1, Kanevsky in view of aapa fails to explicitly disclose a hardware-adaptable data visualization tool where the modules are linked together into one executable file, using generated information as a basis for the source module during execution. However Official Notice is taken that generating information during processing is well known in the art examples of which are multi-processing and concurrent processing. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's tool with the current

teaching. Motivation to do so would have been to utilize the processor to make the overall system more efficient.

As per claim 7, which is dependent on claim 1, Kanevsky in view of aapa fails to explicitly disclose a hardware-adaptable data visualization tool where the modules are linked into a single executable providing a viewer with a capability of examining intermediate results of the data source module as it performs a calculation and steering the calculation of the data source module. However, Official Notice is taken that examining of results during calculations is well known in the art an example is a debugger. As the execution of instructions flow the user is able to view them. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's tool with the current teaching. Motivation to do so would have been to allow the user to oversee the information to defer corruption or error.

As per claim 8, which is dependent on claim1, Kanevsky in view of aapa fails to explicitly disclose a hardware-adaptable data visualization tool where the modules are lined into a single executable, wherein the viewer is connected via network link (Column 5 lines 29-36;) with a capability of examining intermediate results of the data source module as it performs a calculation and steering the calculation of the data source module. However, Official Notice is taken that examining of results during calculations is well known in the art an example is a debugger. As the execution of instructions flow the user is able to view them. Therefore it would have been obvious to an artisan at the time

of the invention to combine Kanevsky and aapa's tool with the current teaching. Motivation to do so would have been to allow the user to oversee the information to defer corruption or error.

As per claim 9, which is dependent on claim 1, Kanevsky in view of aapa discloses a hardware-adaptable data visualization tool as wherein the tool is used for the analysis and engineering design of a fluid dynamic system, wherein the data for visualization provided by the tracking module is particle trajectory data ([0008] lines 9-13;*wherein nozzle location would change particle trajectory*) and

a) data source, which is a CFD module, providing a stream of data ([0007] lines 6-10)

b) viewer module providing view of numerical data set representing flow in an environment ([0008] lines 3-4).

As per claim 10, which is dependent on claim 1, Kanevsky in view of aapa discloses a hardware-adaptable data visualization tool as wherein the tool is used for the analysis and engineering design of a fluid dynamic system in which a reacting flow occurs ([0008] lines 5-9; *as a result of combustion or spray of urea causing a reacting flow*), and

a) data source, which is a CFD module, providing a stream of data ([0007] lines 6-10)

b) viewer module providing view of numerical data set representing flow in an environment ([0008] lines 3-4).

As per claim 11, which is dependent on claim 11, Kanevsky in view of aapa discloses a hardware-adaptable data visualization tool used for designing targeted infurnance injection systems, for controlling a combustion process, the special features for introducing into the combustion process species that react with the combustion products ([0008] lines 5-9)

a) data source, which is a CFD module, providing a stream of data ([0007] lines 6-10)

b) viewer module providing view of numerical data set representing flow in an environment ([0008] lines 3-4).

As per claim 12, which is dependent on claim 1, Kanevsky in view of aapa discloses a visualization tool comprising two more different viewer module, each hosted by a different computer but use the same model (Kanevsky Figure 1; *wherein client machine can be any of those shown in block 113*).

As per claim 13, which is dependent on claim 1, Kanevsky in view of aapa fail to explicitly disclose a visualization tool wherein multiple synchronized dialog boxes are used to prevent data corruption. However, Official Notice is taken that the use of synchronization is notoriously well known in the art for example: mutual exclusion by

way of semaphores. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's tool with the current teaching. Motivation to do so would have been to prevent data corruption when two boxes access the data simultaneously.

As per claim 17, which is dependent on claim 1, Kanevsky in view of aapa fail to explicitly disclose a visualization tool wherein object structures are provided that can be use the same graphics library with more than one VR base library. However, Official Notice is taken that graphics libraries with more than one VR base library is well known in the art one example would be the use of OpenGL with any of the VR libraries including CAVElib and VR juggler. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's tool with the current teaching. Motivation to do so would be to allow the tool to be more flexible in choosing a VR library.

As per claim 21, which is dependent on claim1, Kanevsky and aapa disclose a code section used to visualize all types of tracking objects ([0008] lines 9-16;*wherein streamlines, injectors, and massed injectors are all inherently part of the boiler system*)

As per claim 25, which is dependent on claim1, Kanevsky and aapa fail to disclose injector characteristics definable by a plug-in. However, Official Notice is taken

that plug-in are notoriously well known in the art some examples are: plug-ins for the Netscape® browser and web server, Adobe Photoshop® also uses plug-ins. Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's tool with the current teaching. Motivation to do so would be to add a new feature, and that users need only install the few plug-ins that they need, out of a much larger pool of possibilities.

Claim 26 is similar to the scope of claim 25 and therefore is rejected under similar rationale.

As per claim 28, which is dependent on claim 1, Kanevsky in view of aapa discloses a hardware adaptable data visualization tool, wherein the viewer component module comprise:

a) a data visualization module, responsive to geometry information, providing a representation of the boundaries of the region being viewed ([0007] lines 6-11), and displaying dynamic visualization objects that represent information in the numerical data set ([0008] lines 13-16)

b) interface system module, responsive to user tool controls and inputs and providing changes to the geometry and display characteristics (([0008] lines 9-16), further providing graphics output of the summary data and maintaining standardized instructions for viewing numerical data (*inherently graphics will change if the data changes*)

c) a data interpretation module, for generating graphical objects ([0009] lines 1-5), translating the numerical data set after standard formatting into data for visualization ([0007] lines 6-13)

d) a data translation module, for converting different data source program data structures into a standard application programming interface, and providing the numerical data set according to standard formatting ([0007] lines 6-9).

6. Claims 14-16,19,20, and 27 are rejected under 35 U.S.C. 103(a) as being obvious over Kanevsky ("Kanevsky", US#6,300,947) in view of applicant's admitted prior art ("aapa", US2002/0199156) and in further view of da Vitoria Lobo et al ("da Vitoria Lobo", US#5,537,641).

As per claim 14, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein separate control dialog boxes and visualization windows are provided. However, da Vitoria Lobo teaches separate control dialog boxes and visualization windows (Figure 7). Therefore it would have been obvious to combine Kanevsky and aapa's visualization tool with da Vitoria Lobo's teaching. Motivation to do so would have been to provide a organized interface.

As per claim 15, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool using a scripting language to provide input. However, da Vitoria Lobo teaches a strong scripting language (Column 8 lines 15-25) used to provide input to the automation and scripting module for directing real-time

visualization (Column 7 lines 56-60). Therefore it would have been obvious to combine Kanevsky and aapa's visualization tool with da Vitoria Lobo's teaching. Motivation to do so would have been to provide an effective environment for component use.

As per claim 16, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein a script file is used to generate a visualization picture. However, da Vitoria Lobo teaches a script file used to generate the visualization pictures (Column 8 lines 34-36).

As per claim 19, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein streamlines are colored by time of life. However, da Vitoria Lobo teaches streamlines which are individually colored (Column 10 lines 36-40;*wherein the streamlines are mapped by height but can be mapped in color by any attribute*). Therefore it would have been obvious to combine Kanevsky and aapa's visualization tool with da Vitoria Lobo's teaching. Motivation to do so would have been to easily distinguish the time of the streamline.

As per claim 20, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein a user can code a color map by use of a function. However, da Vitoria Lobo teaches a programming interface provided allowing a user to code a colormap using one or another function f(s) for mapping a scalar value s to a desired color (Column 7 lines 64-67). Therefore it would

have been obvious to combine Kanevsky and aapa's visualization tool with da Vitoria Lobo's teaching. Motivation to do so would have been to easily distinguish each streamline.

As per claim 27, which is dependent on claim1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein contour planes are constructed by sampling points on a regular two-dimensional grid providing contours that are grid independent (Column 2 lines 1-4). Therefore it would have been obvious to combine Kanevsky and aapa's visualization tool with da Vitoria Lobo's teaching. Motivation to do so would have been to allow the objects to be viewed at many different angles not constrained to the two dimensional grid.

7. Claims 18,22-24 are rejected under 35 U.S.C. 103(a) as being obvious over Kanevsky ("Kanevsky", US#6,300,947) in view of applicant's admitted prior art ("aapa", US2002/0199156) and in further view of Hanselman ("Hanselman", The Student edition of MATLAB").

As per claim 18, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool placing multiple graphical representation of particle on a streamline, representing more particles than calculated. However, Hanselman teaches a tool where the viewer places multiple graphical representations of particles on a single streamline, allowing the streamline to visually

represent more particles than are calculated (Page 164 Figure 15.7;*wherein interpolation is the estimation of some basis to make up for the missing particles*). Therefore it would have been obvious to an artisan at the time of the invention to combine Kanevsky and aapa's visualization tool with the teaching of Hanselman. Motivation to do so would be so that the visualization is more complete and less calculations proving for quicker results.

As per claim 22, which is dependent on claim 2, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool with an object-oriented design. However, Hanselman teaches a tool wherein each of the modules are implemented according to and object-oriented design so as to allow the viewer to interpret any type of data (*wherein object oriented design is a key feature in MATLAB allowing its viewer to interpret any type of data*).

As per claim 23, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein each of the modules are implemented to allow the application to interpret different types of cells. However, Hanselman teaches a tool wherein each of the modules are implemented according to an object-oriented design so as to allow the application to interpret different types of cells in a single data source output file (Page 163 Figure 15.6).

As per claim 24, which is dependent on claim 1, Kanevsky and aapa fail to disclose a hardware adaptable visualization tool wherein modules allow pluggable readers for datasets. However, Hanselman teaches a tool wherein modules are implemented according to an objected-oriented design so as to allow pluggable readers for datasets provided by the data source program (page 136; *wherein MATLAB takes any type of dataset as long as the format is compatible regardless if the source is custom or commercial*).

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being obvious over Kanevsky ("Kanevsky", US#6,300,947) in view of applicant's admitted prior art ("aapa", US2002/0199156) and in further view of Stam et al ("Stam", US# 6,266,071).

As per claim 4, which is dependent on claim 1, Kanevsky and aapa fail to disclose using a high-end graphics computer to visualize and a computational one to compute. However, Stam teaches a hardware adaptable visualization tool in which computing equipment most suitable for computation can be used as a host of the data source module, and computing equipment most suitable for providing a view helpful in interpreting the data stream provided by the data source module can be used as a host of the viewer (Column 4 lines 23-27). Therefore it would have been obvious to combine Kanevsky and aapa's visualization tool with Stam's teaching. Motivation to do so would have been to utilize the benefits of each system, such as the graphics of the high-end system, to speed up overall visualization time.

Response to Arguments

Applicant argues that the references do not provide any motivation for the combination, and the combination proposed is not what is defined by the claims.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, both Kanevsky and AAPA are addressing ways of visualizing/displaying data on a screen, and are therefore analogous. Therefore, motivation to combine these references would be to alter visualizations depending on performance capabilities taking into account the variety of different displays in which they may be observed (Kanevsky, Column 1 lines 12-16).

In the case of Kanevsky in further view of aapa and Hanselman, Hanselman teaches MATLAB a well-known tool for visualization of objects based on data sources, primarily numerical data. Examiner asserts that the aapa and Hanselman references clearly teach a visualization tool for use in visualizing data from a data source and are combinable with Kanevsky for at least the reasons stated above. Motivation to do so would have been provide an estimation using interpolation and curve fitting for a more complete result.

In the case of Kanevsky in further view of aapa in further view of Stam, Stam teaches "geometrical description sent to a render module, which calculates an image using the geometrical description" as stated by the applicant. Examiner asserts that the aapa and Stam references clearly teach a visualization tool for use in visualizing data from a data source and are combinable with Kanevsky for at least the reasons stated above. Motivation to combine them would be to provide a high-end graphics subsystem to provide a user with a tool that achieves fluid-like effects in real-time (Stam, Column 1 lines 29-31).

Applicant argues that the examiner's combination seems obvious based on hindsight reasoning.

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

The Applicant argues the examiner's Official Notice rejections.

The examiner points out section 2144.03 in the MPEP that states:

> Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known.

The examiner also points out that the applicants agree that "these statements might apply to any prior art having close relationship to the tools of the invention." The examiner cites the following in regards to the Official Notice claims:

Bracha et al (US 6766521) teaches in Column 1 lines 50-67 and Column 2 lines 1-17:

> It is also known in the art to construct more powerful programs by combining several simpler programs. This combination can be made by copying segments of source code together before compiling and then compiling the combined source. When a segment of source code statements is frequently used without changes it is often preferable to compile it once, by itself, to produce a module, and to combine the module with other modules only when that functionality is actually needed. This combining of modules after compilation is called linking. When the decision on which modules to combine depends on run time conditions and the combination of the modules happens at run time, just before execution, the linking is called dynamic linking.

Rakoshitz et al (US 6816903) teaches in Column 14 lines 14-28:

> Some definitions about the various modules have been described above. These definitions are not intended to be limiting. One of ordinary skill in the art would recognize other variations, modifications, and alternatives. Additionally, the modules described are generally provided in terms of computer software. Computer software can be used to program and implement these modules, as well as others. The modules can be combined or even separated, depending upon the applications. Functionality of the modules can also be combined with hardware or the like. In a specific embodiment, the present modules are implemented on an WindowsNT.TM. operating system, which has been developed by Microsoft Corporation. Of course, other operating systems can also be used. Accordingly, the present modules are not intended to be limiting in any manner.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan F Pitaro whose telephone number is 571-272-4071. The examiner can normally be reached on 7:00am - 4:30pm Monday through Thursday and on alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kristine Kincaid can be reached on 571-272-4063. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan Pitaro
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RFP

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